Specification Amendments

[0001] This application is a division of application serial number 10/073,386, filed February 12, 2002, which is a division of application serial number 09/160,895 filed September 25, ~~1988;~~ 1998, now patent number 6,398,885B1, issued June 4, 2002, which in turn is a continuation-in-part of application serial number 08/582,373, filed January 11, 1996, now abandoned.

[0029] Referring now to Figures 2, 3 and 5 a table is indicated generally at 25, said table being composed of a material which does not conduct induction heating currents. A stainless steel or even a granite or suitable ceramic material may be used in the construction of table 25. The table has a front edge 26, left edge 27, right edge 28 and rear edge 29. Means, in addition to the stainless steel, granite or ceramic material of table 25, for confining the heat from the electric heat source to the body-shank junction portion of the die block includes a ~~A~~ backing plate indicated generally at 30, the lower portion of which, in this instance, is butted against rear edge 29 of the table 25. As can best be seen in Figure 3, backing plate 30 extends upwardly a substantial distance so that its front face 31 forms an abutment wall of considerable height.

[0030] Referring now to Figure 5 an ~~indication~~ induction heating means which may be referred to as a paddle is indicated generally at 35. Paddle 35 is an induction heating coil system composed of a length of continuous, hollow copper tubing, indicated generally at 36, said tubing having an inlet 32, an entry run 37, a bend 39, a return run 40 and an outlet 41. The hollow, fluid tight tubing is enclosed in a steel jacket, indicated generally at 42, whose width

[0031] Referring now to Figures 2 and 3 particularly, the paddle 35 is shown laying flat on the upper surface ~~32~~ 23 of table 25, and butted against the front face 31 of backing plate 30 at the table-backing plate junction. The relationship of the front edge 43 and the rear edge 44 of the paddle 35 to the backing plate 30 is shown best in Figure 2.

[0035] It will thus be seen that the surface of die block 50 which is to be drawn is in contact over its entire surface area with paddle 35 so that electric heat energy generated by paddle 35 directly strikes die block 50, that is, in the absence of any intervening materials. ~~and~~ Further, all portions of the upper surface 33 of paddle 35 which are not covered by the die block have been covered by a blocker so that the upper surface 33 of the paddle is not exposed to the atmosphere.

[0036] In Figure 4 the block 50 has been removed following treatment, and a shank machined into the non-working face thereof. Specifically, the shank 21 may, for example, have a width ~~23~~ of about 4 inches with the left and right sides thereof having a vertical dimension of about 2 inches, and shoulders, or die wings, 71, 72 ~~or~~ of about 10-1/2 inches, so that the total

[0044] The infrared furnace of Figure 6 is a flat panel cold wall furnace; i.e.: only the selected portion of the workpiece, here the body-shank junction portion 87, see Figure 7, of the die block 88, ~~sample~~ is heated to the desired temperature ~~and the~~. The furnace includes a hood, indicated generally at 81, a top 82, depending edge walls 83, 84, tungsten halogen filament heating elements 85, and, in this instance, cooling means indicated at 86, all of which comprise means for confining the heat from the electric heat source to the body-shank junction portion of the die block. The furnace utilizes 100 W per linear inch elements 85 which function as means for subjecting said selected portion to heat energy derived from said source 85 of infrared heating. Due to the low thermal mass of the heating elements 85, the furnace is capable of its full heat flux in approximately 2 seconds after start-up. Also, due to its cold wall design, the furnace cools extremely quickly. The furnace includes conventional means such as any simple raising and lowering linkage, not shown in detail for purposes of clarity, for maintaining said selected portion 87 and said source of infrared heating 85 in fixed relationship to one another during subjection of said selected portion 87 to said source of infrared heating 85.

[0045] In one demonstration, approximately 12 infrared heat treatments were performed on an 18- x 22- x 12-in.-thick steel block instrumented with 12 thermocouples located at various depths and locations throughout the block. In this demonstration, means for controlling the depth in the steel block to which the infrared heating is applied consisted of applying a maximum of 51.2 kW on ~~A maximum of 51.2 kW was utilized on~~ the top surface (22 by 18 in.) of the steel block with an infrared flat panel for 47 minutes